REMARKS

Information Disclosure Statement

As suggested, Applicants submit herewith an IDS including all the cited references in the specification.

Claim Rejections under 35 U.S.C. § 102

Claims 1-4, 6-12 and 14-15 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,521,915 to Odaki et al. (hereinafter "*Odaki*"). Applicants respectfully traverse. Nevertheless, claim 1 has been amended to incorporate the subject matter of claim 5. Therefore, Applicants request that the rejection of claim 1 be withdrawn.

Because independent claim 1 is allowable, then for at least this reason, its dependent claims 3, 6-12, and 14-15 are also allowable. Applicants therefore respectfully request that the rejection of these claims be withdrawn as well. There may be other reasons why the dependent claims are allowable.

Claim Rejections under 35 U.S.C. § 103

Claims 5, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Odaki* as applied to claim 1. Applicants respectfully traverse.

Claim 5 has been canceled and its subject matter (and that of intervening claim 4) has been incorporated into independent claim 1. Therefore, the rejection of claim 5 will be addressed with respect to claim 1. First, the Office uses the covering material 21 formed of a phosphorus composition that has a thickness of 0.35 mm to reject the thickness of the phosphor coating recited in claim 1. *See Office Action* at 4. The thickness recited in claim 1 is 15 to 150 micrometers, which is range that does not cover 0.35 millimeters (equal to 350 micrometers). The thickness of the coating taught by Applicants is clearly in a range outside of the thickness recited by *Odaki*.

The Office further makes the following blanket statement:

> it would have been obvious to one having ordinary skill in the art at the time the invention was made to find the claimed range of thickness, since it has been held where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art....

Office Action at 4-5. Applicants respectfully traverse this statement as applied to claim 1. As noted by the Federal Circuit, "The mere fact that the prior art may be modified in the manner

suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 972 F.2d 1260, 1266, 23 U.S.P.Q.2d 1780 (Fed Cir. 1992) (emphasis added). Nothing in *Odaki* teaches or suggests the desirability of forming a phosphor coating of a range well outside of the thickness cited in one Example in *Odaki*. Applicants submit that there is an infinite range of values for the thickness of the phosphor coating that could be used in the claimed light emitting device. Applicants have discovered a particular value in the infinite range of possibilities that has proven beneficial for its light emitting device that is non-obvious from *Odaki*. Therefore, Applicants respectfully request that the rejection of claim 1 be withdrawn for at least this reason.

Because independent claim 1 is allowable, then for at least this reason, its dependent claims 13 and 16 are also allowable. Applicants therefore respectfully request that the rejection of these claims be withdrawn as well. There may be other reasons why these dependent claims are allowable.

Newly Added Claims

Claims 17-22 have been newly added to further define and/or clarify the scope of the invention.

(a) Claims 17-19

Newly added claim 17 mirrors the subject matter of previously pending claim 13 before the amendment to claim 1. Therefore, the allowability of claim 13 will be argued with respect to new claim 17. The Office admits that *Odaki* does not meet the following feature of claim 17: "the phosphor composition comprises a material selected from $Mg_4GeO_{5.5}F:Mn^{4+}$: and $ZnS:Mn^{2+}$. *See Office Action* at 5. As noted above, the Office makes the following conclusory statements:

> [T]he claim materials are well known red emitting phosphor.
> Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use these red emitting phosphor instead of $Cas:Eu^{2+}$, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use....

Id. at 5. Applicants respectfully traverse these statements as applied to claim 20. Nothing in *Odaki* teaches or suggests the desirability of substituting the claimed phosphor composition. Further, the Applicants contest the statement that "the claimed materials are well known red

emitting phosphor." The Office has provided no support *in the rejection* to support this statement.

> The Office does state in the section "Other Prior Art Cited" the following:
>
> (1) Butterworth (US 5929999): teaches that the material $Mg_4GeO_{5.5}F:Mn^{4+}$ is a red emitting phosphor.
> (2) Stewart (US 5302966): teaches that the material $ZnS:Mn^{2+}$ is a red emitting phosphor.

Id. at 5. It appears that the Office is attempting a back-door rejection under 37 CFR 103(a) based upon a combination of references. As such, Applicants, respectfully traverse the statements above with respect to *Butterworth* and *Stewart* and submit that the combination of these references with *Odaki* does not render claim 17 obvious.

With respect to *Butterworth*, this reference is not analogous to *Odaki*. *Butterworth* "relates to a device for measuring color and more particularly to a light source used in a calorimeter" (col. 1, lines 5-6), whereas *Odaki* "relates to a covering member that enables a conventional blue or green light-emitting diode device to emit white light, and a white light-emitting diode device using the covering member" (col. 1, lines 9-13). The devices and their functions are different in the two references.

Additionally, it would not be well-known from *Butterworth* to use the material $Mg_4GeO_{5.5}F:Mn^{4+}$ as a red phosphor emitting composition because *Butterworth* teaches a different material, namely, "Mg4(F)GeO5:Mn". Col. 5, line 45. The composition of *Butterworth* uses a different stoichiometric amount of oxygen, and does not use the ionic form of manganese to activate the phosphor.

Further, *Butterworth* actually teaches away from the success of using inorganic phosphor materials. For example, *Butterworth* states the following:

> The use of fluorescent organic dyes appears to be more efficient than the use of inorganic materials as an additive to the epoxy lens 62 to shift the wavelength of light emitted from a blue LED. Inorganic dyes are typically powders, whereas organic dyes are typically liquids. When integrated into the epoxy lens covering a blue LED, powder particles from inorganic dyes can block or scatter some of the emitted light. However, liquid fluorescent organic dyes mixed with epoxy create non-scattering, or non-blocking, lenses.

Col. 5, lines 49-57. One reading the disclosure of *Butterworth* would not be motivated to use the described phosphor in the device of *Odaki*. Therefore, the Office is incorrect that it is

"well known", at least based on the cited evidence to use the as a phosphor composition that is capable of absorbing light from a cyan LED and emitting red light, as recited in claim 17.

Similarly, with respect to *Stewart*, this reference is not analogous to *Odaki*. *Stewart* is directed to "an active matrix electroluminescent display (AMELD) having an improved light emitting efficiency and methods of operating the AMELD to produce gray scale operation" (col. 1, lines 5-8), whereas *Odaki* "relates to a covering member that enables a conventional blue or green light-emitting diode device to emit white light, and a white light-emitting diode device using the covering member" (col. 1, lines 9-13). The devices and their functions are different in the two references.

Additionally, *Stewart* teaches that the red phosphor is "formed from the combination of ZnS:Mn phosphor and a filter. The filter is a red polyimide or CdSSe filter...." Col. 7, lines 45-47. Thus, even *Stewart* does not teach or suggest using $ZnS:Mn^{2+}$ with its filter as a phosphor composition that is capable of absorbing light from a cyan LED and emitting red light, as recited in claim 17.

Claims 18-19 are allowable for at least the reason that they depend from claim 17. In addition, claims 18 and 19 further define the invention over the cited art.

(b) Claims 20-22

Newly added claim 20 mirrors the subject matter of previously pending claim 16 before the amendment to claim 1. Therefore, the allowability of claim 16 will be argued with respect to new claim 20. The Office admits, "*Odaki* is silent about the diameter of the phosphor particles," as claimed in claim 20. *Office Action* at 4. As noted above, the Office makes the following very conclusory statement:

> it would have been obvious to one having ordinary skill in the art at the time the invention was made to find the claimed range of thickness, since it has been held where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art....

Id. at 4-5. Applicants respectfully traverse this statement as applied to claim 20. Nothing in *Odaki* teaches or suggests the desirability of including phosphor particles in a white-light emitting device that have a mean particle diameter in the range of about 13 to 20 micrometers.

Applicants submit that there is an infinite range of values for the mean particle size of the phosphor particles that could be used in the claimed light emitting device. Applicants

have discovered a particular value in the infinite range of possibilities that has proven beneficial for its light emitting device that is non-obvious from *Odaki*. Indeed, the instant specification recites the following:

> In some embodiments, the mean particle diameter of the phosphor particles is in the range of 2-5 micrometers. Larger phosphor particles tend to emit light more efficiently; however, obtaining uniform coatings of phosphor particles becomes more difficult as size increases. Electrophoretic deposition methods have been used successfully with larger phosphor particles, e.g. having mean particle diameter in the range of about 13 micrometers to about 20 micrometers....

US 2004/0263073 at paragraph 0031. Thus, Applicants have been able to fabricate a light-emitting device with phosphor particles having a relatively larger mean particle diameter, which in turn emits light more efficiently than other devices. *Odaki* does not recognize or suggest the benefit of the device of claim 20. Therefore, for at least these reasons, Applicants submit that claim 20 is allowable.

Claims 21-22 are allowable for at least the reason that they depend from claim 20. In addition, claims 21 and 22 further define the invention over the cited art.

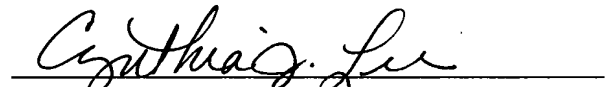
Prior Art Made of Record

The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicants respectfully submit that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims 1, 3, and 6-22 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned agent at (770) 933-9500.

Respectfully submitted,



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